DOCUMENT RESUME

ED 038 376 SP 003 849

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TITLE Pupil Imitation of a Rewarding Teacher's Verbal Behavior.
PUB DATE [69]
NOTE 14p.

EDRS PRICE EDRS Price MF-$0.25 HC-$0.80
DESCRIPTORS Behavior Patterns, *Classroom Observation Techniques, Elementary School Students, *Imitation, Interaction Process Analysis, Preschool Children, Reinforcement, *Student Behavior, Student Teacher Relationship, *Teacher Influence, *Verbal Development

ABSTRACT

Patterns of teacher and student verbal behavior within a framework of reinforcement theory were analyzed through the use of a modified form of the Observation Schedule and Record 4V (OScAR). The study examined the extent to which the rewarding teacher's classroom discourse served as a model for the verbal style of a student among his peers. Data were initially collected from 30 groups; 10 preschool, 10 kindergarten, and 10 first grade classrooms. From each of these levels, six classes showing the highest frequency of teacher reinforcing verbal behavior were selected, and designated as the "rewarding teacher" group. Four pupils (two boys, two girls) were chosen at random from each class to form the final sample (N=72). The verbal statements of these pupils were scored using five scales of imitative behavior developed from the OScAR protocols. The data were analyzed using a 2 x 3 factoral design (sex x grade levels). Female pupils imitated significantly more than males on four of the five verbal categories. In three of the analyses grade level differences were located, and for only one analysis was there a significant interaction. Three findings are of importance in demonstrating the potential of the OScAR technique for measuring constructs such as imitation and for measuring pupil as well as teacher behavior. (Included is a 22-item list of references.) (Author)

ED038376

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SP003849

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A number of studies have demonstrated that children often modify their behavior as a result of simple exposure to a model (e.g. Bandura, 1962; Maccoby, 1959). Most of this research on the imitative behavior of children has been accomplished in a carefully controlled laboratory atmosphere. It would be of interest to determine if a child's verbal behavior could be changed by placing him in an ecologically natural situation where he has ample opportunity to observe, and perhaps to imitate, a verbal model. The preschool and elementary school classroom provides an excellent natural setting to study this issue, with the teacher becoming the model for imitation. The purpose of this study was to determine the amounts and kinds of verbal behavior elicited by the teacher which is subsequently dispensed by early school age children to each other within the classroom.

The Observation Schedule and Record 4V (OScAR), with some modifications, was employed in obtaining normative information about patterns of teacher and student verbal behavior within a framework of reinforcement theory. Several authors have contributed to a hypothesis that rewarding models are imitated to a greater extent than non-rewarding models, even though the imitation act may not in itself be reinforced. Mowrer's theory of imitation (1950; 1960) is based upon the principle of secondary reinforcement from classical learning theory. A child will continue to

imitate a model's behavior on occasions where direct reinforcement is not provided, because stimuli associated with a history of reinforcements have acquired secondary reinforcing properties. Experimental support of this hypothesis is provided in a study by Bandura and Huston (1961) who found that preschool Ss who had been given considerable social reward during 30 minutes of play imitated both verbal and motor responses displayed by the model to a much greater extent than Ss experiencing a similar period of non-rewarding interaction with the model. Social power (Maccoby, 1959) and dependency (Sears, 1957) have been identified as important variables affecting the amount of imitation, with an individual often being chosen as a model simply because he has the power to provide or withhold reward. An observer may also vicariously experience any reinforcement perceived to be attained by the model, resulting in an increased likelihood of imitation without direct reward of observer behavior (Bandura, Ross, and Ross, 1961).

Model characteristics, type of behavior being modeled, and individual observer differences have been investigated as factors in the imitation process. Children tended to imitate a like-sex model more frequently than an opposite sex model in various experimental situations (e.g. Hartup, 1962; Bandura, Ross, and Ross, 1963; Maccoby and Wilson, 1957). Mischel and Grusec (1966) showed that imitation was enhanced by additional reinforcement from a model, but this effect depended on the type of behavior: aversive or neutral. Boys generally showed more imitative physical aggression than girls, the difference attributed to the clearly

sex-linked nature of the behavior (Bandura, Ross, and Ross, 1961). One study (Rosenblith, 1959) concluded that attentiveness of the model, when compared to attention withdrawal, markedly increased imitation, but only in preschool girls. Reliable differences in modeling behavior have been found at various age levels (e.g. Schwartz, 1959). A typical result was that 4 year old boys and 6 year old girls imitated significantly more often than 4 year old girls and 6 year old boys (McDavid, 1959).

The findings reviewed above may be summarized in that they 1) support a reinforcement theory of imitation, and 2) suggest that there are individual and environmental differences which modify the effect of a reinforcing model. Along these lines, the following experiment was based on the assumption that a reinforcing teacher-model is particularly conducive to a pupil's imitation of her behavior. This assumption was made even though it was recognized that any particular child in a classroom may receive directly only a very small amount of the teacher's total reward output. The expectation was that young children manifest a wide variety of imitative behavior, and that developmental stages would be apparent. Hence, it was predicted that the early school years contain a period of marked increases in the pupil's use of imitated verbal behavior in his social interaction with his classmates. It was also expected that some differences between boys and girls would occur with respect to the utilization of the teacher's verbal characteristics.

Method

Subjects. The children observed were enrolled either in a Chicago preschool, or at the kindergarten or first grade level in New York or Chicago inner city public schools. The pool from which Ss were drawn consisted of 10 classes, with 10 separate teachers, at each of the 3 grade levels. In addition to the teacher, within each class 4 students were arbitrarily selected for observation. The total sample included 60 boys and 60 girls. Although there was some overlapping in the children's ages among the three grade levels, there was a mean difference of almost 8 months between the preschool and kindergarten groups, and slightly more than 6 months between the kindergarten and first grade classes.

Procedure. Observations were carried out over a four week period near the end of the school year. The observer always spent some time sitting in the room, prior to collecting any data, to allow the teacher and students to become accustomed to his presence. The teachers were informed by the observer beforehand that an experimenter would be in the room, but they were not given any indication of the type of data to be recorded. The main reason for this pre-observational "conference" was to determine whether the teacher intended to allow the students to form groups and to work on their own sometime during the day's lesson.

A single observer using the OScAR 4V rated the teacher during three 4-minute sessions. On the same day, during a subsequent period of inter-student activity without direct teacher interaction, similar accounts of

the verbal interaction occurring between a student and his peers were recorded. The recording schedule was a virtual duplicate of the OScAR 4V with the individual student being rated in exactly the same manner as the teacher, and his peers playing the role of the students. A small group containing at least 4 students (2 males and 2 females) was carefully observed. The 4 children were rated in random order for 1-minute periods. Four 1-minute time segments were recorded for each student. In this manner a detailed account was attained of the child's verbal behavior, and that of any child with whom he interacted.

Similarity between the student's and teacher's verbal characteristics was employed as an operational definition of imitation. Five categories of verbal behavior were tabulated from both the student and teacher schedules (Bowers and Vogel, 1967; Cronbach, 1958).

I) Substantive Ratio -- Ratio of (Substantive statements + Substantive interchanges + Describing + Informing + Problem structuring) to Total.

II) Continuing-Initiating Ratio -- Ratio of Continuing statements to Initiating statements.

III) Indirect-Direct Ratio -- Ratio of (Supportive + Approving + Accepting statements) to (Non-evaluating + Neutrally rejecting + Rebuking + Criticizing + Directing statements).

IV) Ratio Summation -- The sum of categories I, II, and III.

V) Assumed Dissimilarity -- $D = \sqrt{\left(\frac{X_i}{T}\right)^2 - \left(\frac{Y_i}{t}\right)^2}$. A general measure of imitation; X represents a teacher statement, Y represents a statement of

the observed student, T the total teacher verbal behavior, t the total student verbal behavior, and i any individual category on the two OScAR schedules. The degree of imitative behavior is defined as a reflection of the absolute difference of the ratios (categories I-IV) from the two observation schedules, and the size of the Assumed Dissimilarity (category V).

Analyses. The initial step in selecting the classes to be used in this experiment was a measurement of the reinforcement frequencies occurring among the teachers. The observation records were screened for instances in which the teacher verbally dispensed "social reinforcement" during the lesson. Four categories of positive social reinforcers were tabulated: 1) Considering--a statement revealing sensitivity to pupil feelings, 2) Supporting--a praising or enthusiastic response indicating the correctness of a student's behavior, 3) Approving--a non-enthusiastic response indicating acceptance of the student's behavior, and 4) Non-Substantive Pupil Initiate Interchange (positive)--a statement indicating that the teacher accepts, approves, or supports a pupil's suggestions (Medley, Impellitteri, and Smith, 1969). The ratio of the sum of these four categories divided by the total verbal record of the teacher was assumed to be an index of the model's frequency of reinforcement.

At each grade level, the 6 teachers with the highest scores on this "reinforcement ratio" were determined, and 72 of their students used for subsequent analysis. A 2 x 3 factorial design with 12 children of each sex at each of the three grade levels was employed.

Results

The series of two-way analyses of variance, with each of the 5 categories of verbal behavior becoming a dependent variable revealed some grade and sex differences. The Newman Keuls test (Winer, 1962) was employed for multiple comparisons among the grade and sex levels when the main effects proved significant. For Ratio Summation (IV) there was a significant grade difference ($F = 8.21$, $df = 2/66$, $p < .01$). Individual comparisons revealed that first grade students showed significantly more imitative behavior than either kindergarten ($q(2,66) = 3.80$, $p < .01$) or pre-school students ($q(3,66) = 6.25$, $p < .01$), while the difference between pre-school and kindergarten failed to reach significance ($q(2,66) = 2.09$).

This observed grade difference is somewhat misleading as evidenced by an analysis of the Ratio Summary into its more specific components of verbal behavior (see Table 1). Most of the difference is accounted for by category I (Substantive Ratio) ($F = 13.34$, $df = 2/66$, $p < .01$), with neither of the other two Ratios reaching a significant level (Table 1). Using the Substantive Ratio, the increase in imitative behavior the higher the grade level is most evident ($q(2,66) = 5.57$, $p < .01$, comparing the kindergarten and first grade classes; $q(2,66) = 5.04$, $p < .01$ comparing the pre-school and kindergarten classes). The second general measure of imitative behavior, Assumed Dissimilarity, also revealed a significant main effect of grade level ($F = 3.82$, $df = 2/66$, $p < .05$). With this measure, however, no statistical distinction

could be made between the kindergarten and pre-school groups ($q(2,66) = 1.67$).

There were significant sex differences showing greater verbal imitation by girls in 4 categories, with only the Continuing-Initiating Ratio failing to reach a significant level (Table 1). For category III (Indirect-Direct Ratio) a significant class by sex interaction was found ($F = 4.36$, $df = 2/66$, $p < .05$).

Discussion

The analysis presented above suggests an increase in a student's imitation of the verbal behavior of his teacher from the preschool to the first grade levels. Although we have considered the mean age differences of the children in the three grades, a more important variable may be the increase in social experience. Along these lines, the findings coincide with the conclusions of Charlesworth and Hartup (1967) and others concerning the positive correlation between the degree of social participation and age level. The present findings, however, reveal that some verbal characteristics of a teacher may be more susceptible to imitation than others.

The analysis revealed that imitation of the teacher's Substantive Ratio, which is a measure of the proportion of her statements referring directly to classroom content and containing no affect, is the greatest source of difference among the three grade levels. One may ask if this is really an index of imitative behavior. It may be argued that all we

have demonstrated is that the first grade teacher tends to set up a more "formal" classroom atmosphere than the kindergarten or preschool teacher. In the first grade the teacher places a greater emphasis on problem structuring, course work, and the conveyance of factual material, and less emphasis on the game and role playing of the kindergarten. Consequently, the peer group conversation should be more substantive, and closer to the typical verbal characteristics of a teacher.

A number of factors point to the inadequacy of this argument as an interpretation of the data. A simple comparison of the average Substantive Ratio's of the students at the kindergarten and first grades showed no significant difference ($t = .84$, $df = 46$). Furthermore, the variance of this Substantive Ratio among classes at the same grade level is very large for both students and teachers. Finally, despite the fact that the mean Substantive Ratio for the six preschool teachers was significantly greater than that for the kindergarten teachers ($t = 2.09$, $p < .05$), our data indicates more similarity between the kindergarten teachers and their students on this verbal category ($q(2,66) = 5.04$, $p < .01$).

Our most impressive result is the evidence for an early formation of sex differences in imitating the teacher's verbal traits. Two additional factors must be considered in interpreting these results. First, all of the 18 teachers included in our final sample were women. Since the sex of the model has been demonstrated time and again to be significant in both the identification and imitation processes (e.g. see Sears, 1953; Mussen & Rutherford, 1963; Hartup, 1962), the teachers' femininity

probably plays a great role in explaining the pupil differences. Hence, any general conclusion of sex differences in the utilization of imitative behavior will depend on additional research with male teachers. Second, we may question to what extent these sex differences in imitation are independent of differences in the general level of social activity between young boys and girls. Charlesworth and Hartup (1967), for example, found that boys participated in considerably more "give and take play" in the nursery school than girls. Along these lines, it is interesting to note that in terms of what may be called "total verbal activity" (total score on all the OScAR categories), the mean frequency for the boys was slightly higher than for girls, although this was not significant (t = .47, df = 70). This would indicate some degree of independence between our measures of imitation and quantity of verbal interaction.

The extension of the OScAR 4V observational technique has yielded promising results in measuring student as well as teacher verbal behavior, and the factor of imitation as one form of interaction between the two. The results of the study imply individual differences in opportunity and ability to develop identifications with the teacher. While a student's contact with his teacher lacks the intensity of his contacts with his parents or peers, there is every reason to believe that the direct observation of student-teacher interactions can contribute to a broader conception of classroom learning.

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Table 1

Analyses of Variance of Imitation Measures

		Imitation Scores				
		Substantive Ratio	Continuing-Initiating Ratio	Indirect-Direct Ratio	Ratio Summation	Assumed Dissimilarity
Source	df					
Grade	2	13.34**	<1.00	< 1.00	8.21**	3.82*
Sex	1	6.13*	1.03	5.32*	4.86*	5.70*
G X S	2	2.21	<1.00	4.36*	< 1.00	< 1.00
Within	66					

*p < .05

**p < .01